

periods, and, as compensation, farmers were able to thoroughly cultivate crops and kill grass and weeds.

On the whole, the dry spring was beneficial to the extensive logging interests of southern Mississippi. While rafting has been impeded to some extent, the low water has enabled lumbermen to work with scarcely any interruption in the low lands where inundations are ordinarily of frequent occurrence.

TABLE 1.—Total rainfall and resulting river stages on the Pearl and Pascagoula river systems during six successive spring seasons.

JACKSON, MISS. (Flood stage, 20 feet.)

| Year.     | River stages. |          |         | Total rainfall. |
|-----------|---------------|----------|---------|-----------------|
|           | Average.      | Highest. | Lowest. |                 |
|           | Feet.         | Feet.    | Feet.   | Inches.         |
| 1905..... | 13.0          | 21.3     | 6.5     | 16.10           |
| 1906..... | 12.1          | 29.6     | 3.2     | 17.28           |
| 1907..... | 12.8          | 27.3     | 3.0     | 18.66           |
| 1908..... | 18.2          | 28.6     | 4.9     | 20.19           |
| 1909..... | 18.5          | 35.3     | 5.8     | 22.95           |
| 1910..... | 5.5           | 16.4     | 1.5     | 10.89           |

PEARL RIVER, LA. (Flood stage, 12 feet.)

| Year.     | Average. | Highest. | Lowest. | Total rainfall. |
|-----------|----------|----------|---------|-----------------|
|           | Feet.    | Feet.    | Feet.   | Inches.         |
| 1905..... | 11.0     | 15.2     | 4.7     | 24.53           |
| 1906..... | 12.3     | 15.5     | 8.0     | 14.88           |
| 1907..... | 12.3     | 15.3     | 8.9     | 15.51           |
| 1908..... | 7.8      | 13.3     | 4.3     | 4.99            |

SHUBUTA, MISS. (Flood stage, 25 feet.)

| Year.     | Average. | Highest. | Lowest. | Total rainfall. |
|-----------|----------|----------|---------|-----------------|
|           | Feet.    | Feet.    | Feet.   | Inches.         |
| 1905..... | 8.1      | 24.1     | 3.0     | 16.22           |
| 1906..... | 13.3     | 39.2     | 3.0     | 22.36           |
| 1907..... | 16.0     | 34.5     | 4.4     | 21.98           |
| 1908..... | 10.9     | 28.5     | 4.8     | 21.32           |
| 1909..... | 12.3     | 43.0     | 2.2     | 29.43           |
| 1910..... | 4.4      | 15.4     | 1.4     | 8.14            |

MERRILL, MISS. (Flood stage, 20 feet.)

| Year.     | Average. | Highest. | Lowest. | Total rainfall. |
|-----------|----------|----------|---------|-----------------|
|           | Feet.    | Feet.    | Feet.   | Inches.         |
| 1905..... | 12.1     | 19.6     | 6.2     | 21.33           |
| 1906..... | 11.3     | 21.6     | 3.3     | 18.14           |
| 1907..... | 13.8     | 21.7     | 3.5     | 32.32           |
| 1908..... | 12.9     | 20.4     | 5.9     | 17.50           |
| 1909..... | 11.2     | 20.0     | 3.2     | 23.52           |
| 1910..... | 5.1      | 15.0     | 0.4     | 5.38            |

### STREAM FLOW OF THE OCMULGEE AND OCONEE RIVERS IN GEORGIA.

By W. A. MITCHELL, Observer, Macon, Ga.

Continuing the study of the stream flow of the rivers of Georgia, as begun in the March issue of the MONTHLY WEATHER REVIEW, the following records are given relating to the Altamaha River system. This system comprises the Altamaha and its 2 main tributaries, the Ocmulgee and Oconee rivers. Both tributaries rise in the north-central portion of the State and flow southeastward through narrow valleys, parallel most of the way, and unite about 130 miles from the Atlantic coast to form the Altamaha. River gages are maintained at Macon, Hawkinsville, Abbeville, and Lumber City on the Ocmulgee, and at Milledgeville and Dublin on the Oconee. The records at Hawkinsville and Lumber City are for only about 2 years and are not given.

A proper discussion of the stream flow of any river includes mention of the amount of rainfall and the manner of its occurrence, the temperature, and the topography of the country drained. As to topography, the upper portions of the basins of both the Ocmulgee and Oconee rivers lie among the hills, and there is considerable fall from their headwaters to what is known as the "fall line," which passes near Macon and Milledgeville and which marks the line of transition from the Piedmont Plateau to the Coastal Plain. In this upper portion of both rivers the fall is nearly 500 feet and there are many fine power possibilities, some of which are being utilized. From the fall line southward the slope is more gradual and the flow of the river slow and regular.

A knowledge of the effect of topography is very essential in forecasting the flow of these streams because, whereas a rise will move from the upper portions of both rivers to the fall line, one-third the length of the valley, in 36 to 48 hours, it will require nearly 3 weeks to move over the other two-thirds of the distance to the coast. The mean river stages for 2 stations on the Ocmulgee and for 2 on the Oconee are given in the tables, together with data in regard to the length of record, etc.; also the normal rainfall for both basins as determined from 12 stations.

#### Mean stages of the Ocmulgee River.

MACON, GA.

This station is 203 miles from the confluence of the Ocmulgee and Oconee rivers and 333 from the coast. Record, 10 years. Flood stage, 18 feet.

| Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|------|------|------|------|-------|-------|------|-------|------|------|------|
| 4.7  | 8.0  | 7.6  | 6.3  | 4.4  | 5.0   | 4.0   | 4.6  | 3.3   | 2.6  | 2.7  | 4.9  |

ABBEVILLE, GA.

This station is 91 miles from the confluence of the Ocmulgee and Oconee rivers and 224 from the coast. Record, 6 years. Flood stage, 11 feet.

| Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|------|------|------|------|-------|-------|------|-------|------|------|------|
| 7.0  | 9.2  | 8.5  | 6.6  | 5.6  | 4.3   | 3.8   | 4.7  | 3.2   | 2.5  | 2.4  | 5.1  |

#### Mean stages of the Oconee River.

MILLEDGEVILLE, GA.

This station is 147 miles from the confluence of the Oconee and Ocmulgee rivers and 277 from the sea. Record, 6 years. Flood stage, 25 feet.

| Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|------|------|------|------|-------|-------|------|-------|------|------|------|
| 5.4  | 7.4  | 6.7  | 5.1  | 4.1  | 4.2   | 4.2   | 5.2  | 3.2   | 2.8  | 3.0  | 5.2  |

DUBLIN, GA.

This station is 79 miles from the confluence of the Oconee and Ocmulgee rivers and 209 from the sea. Record, 10 years. Flood stage, 30 feet.

| Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|------|------|------|------|-------|-------|------|-------|------|------|------|
| 4.9  | 8.7  | 7.9  | 6.1  | 3.2  | 3.5   | 2.8   | 2.9  | 1.8   | 0.9  | 1.1  | 3.6  |

#### Normal precipitation over Ocmulgee and Oconee basins.<sup>1</sup>

| Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |
|------|------|------|------|------|-------|-------|------|-------|------|------|------|
| 4.10 | 5.29 | 5.08 | 3.52 | 3.17 | 4.25  | 4.95  | 5.40 | 3.40  | 2.37 | 2.76 | 4.24 |

<sup>1</sup>Computed from the normal rainfall at Athens, Abbeville, Atlanta, Covington, Dublin, Eatonton, Forsyth, Greensboro, Hawkinsville, Macon, Milledgeville, and Monticello.

The average rainfall is practically the same in the basins of both rivers. It contains two periods of maximum, one in February and March, and a second one in August. A period of minimum rainfall occurs in October and November, and another not quite so small in April and May. The highest average stage of water in both rivers is coincident with the period of maximum rainfall in February and March, but at the time of greatest summer rainfall only a slight average rise in the rivers occurs, showing the influence of temperature as increasing evaporation, as well as the greater absorption of moisture by plants in summer than in winter; the soil being in a state of cultivation also holds more water. Occasionally high stages are reached in summer. The highest stage ever recorded at Macon occurred in August, 1887, when a height of 24 feet was attained. Summer floods, however, are exceptional. At the time of the minimum rainfall in October and November very low river stages are reached and such conditions interfere seriously with traffic on the streams, which has to be suspended during the fall months.

Then, too, the character of the rainfall plays an important part in the flow of the streams. On account of the very narrow

valleys of both rivers heavy and sudden rains pass quickly into the channels and cause high stages.

Flood stages are quite frequent in the Ocmulgee, having been exceeded in every year except three at Macon since the establishment of the station in 1899. Below Macon flood stages are still more often reached on account of the nature of the valley and the wider fluctuations, the average stages being higher in winter and lower in summer.

The following are the highest and lowest stages recorded on both streams:

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| Stations.           | Maximum stage. |               | Minimum stage. |                |
|---------------------|----------------|---------------|----------------|----------------|
|                     | Height.        | Date.         | Height.        | Date.          |
| Ocmulgee River.     | <i>Fest.</i>   |               | <i>Fest.</i>   |                |
| Macon .....         | 24.0           | Aug., 1887    | — 1.0          | Oct. 5, 1904   |
| Abbeville .....     | 17.5           | May 2, 1909   | — 1.0          | June 17, 1898  |
| Oconee River.       |                |               |                |                |
| Milledgeville ..... | 27.3           | Apr. 27, 1908 | 0.1            | Sept. 28, 1905 |
| Dublin .....        | 25.8           | Mar. 5, 1902  | — 1.5          | Oct. 26, 1904  |